

DOCKET NO. 123857-00002 (SAND06-07196)

SERIAL NO. 10/695,304

PATENT

IN THE CLAIMS:

Following are the current claims. For the claims that have **NOT** been amended in this response, any differences between the claims below and the current state of the claims is unintentional and in the nature of a typographical error:

1. (Currently Amended) A method of estimating information about a target based on data from a plurality of flight passes, the method comprising:

determining first information from a first flight pass of an antenna pair carried together on an aircraft, the first information specifying a first geometric relationship between the first flight pass and a reference point;

determining second information from a second flight pass of an antenna pair carried together on an aircraft, the second information specifying a second geometric relationship between the second flight pass and said reference point;

using applying geometric analysis to the first and second information geometric relationships to estimate an antenna baseline length between the first and second flight passes; and

estimating one of a ground range position and height of the target based on the antenna baseline length estimate and one of the first and second geometric relationships.

2. (Currently Amended) The method of Claim 1, wherein each of said determining steps includes producing for the corresponding flight pass range and phase measurements relative to [[a]] the reference point.

3. (Original) The method of Claim 2, wherein each said producing step includes producing the range and phase measurements relative to a predetermined point spatially associated with the corresponding antenna pair.

DOCKET NO. 123857-00002 (SAND06-07196)
SERIAL NO. 10/695,304
PATENT

4. (Currently Amended) The method of Claim 3, wherein said ~~using~~ applying step includes, for each antenna pair, using the range and phase measurements to determine a distance from the reference point to a groundpoint beneath the predetermined point wherein an approximately straight line drawn from the groundpoint to the predetermined point forms approximately a right angle with a horizontal plane containing the reference point.

5. (Currently Amended) The method of Claim 3, wherein said ~~using~~ applying step includes, for each antenna pair, using the range and phase measurements to determine a distance from the predetermined point to a groundpoint beneath the predetermined point wherein an approximately straight line drawn from the groundpoint to the predetermined point forms approximately a right angle with a horizontal plane containing the reference point.

6. (Original) The method of Claim 3, wherein the predetermined point is a midpoint between the corresponding antenna pair.

7. (Currently Amended) The method of Claim 1, wherein said ~~using~~ applying step includes using the first and second ~~information~~ geometric relationships to produce respective first and second sets of ground range and height information.

8. (Currently Amended) The method of Claim 7, wherein said ~~using~~ applying step includes calculating a difference between the ground range information of said sets and a difference between the height information of said sets, squaring each of the differences, adding the squared differences, and taking the square root of the sum of the squared differences.

9. (Currently Amended) The method of Claim 7, wherein said ~~using~~ applying step includes providing each set of ground range information and height information measured relative to [[a]] the reference point and a predetermined point spatially associated with the corresponding antenna pair.

DOCKET NO. 123857-00002 (SAND06-07196)
SERIAL NO. 10/695,304
PATENT

- 10 (Currently Amended) The method of Claim 1, wherein said estimating step includes using the baseline length to calculate an antenna angle formed between a line from [[a]] the reference point to a predetermined point spatially associated with one of the antenna pairs and a line from the predetermined point to the target.
11. (Original) The method of Claim 10, wherein said estimating step includes determining a sign of the antenna angle.
12. (Original) The method of Claim 11, wherein the sign of the antenna angle is positive when the reference point is located horizontally between the predetermined point and the target.
13. (Original) The method of Claim 11, wherein the sign of the antenna angle is negative when the target is located horizontally between the reference point and the predetermined point.
14. (Original) The method of Claim 11, wherein said estimating step includes estimating one of the ground range position and the height of the target based on the sign of the antenna angle.
15. (Currently Amended) The method of Claim 1, wherein both ~~determining steps use~~ the first and second flight passes involve the same antenna pair.
16. (Currently Amended) The method of Claim 1, wherein said estimating step includes estimating both the ground range position and the height of the target based on the antenna baseline length and one of the first and second geometric relationships.
17. (Currently Amended) An apparatus for estimating information about a target based on data from a plurality of flight passes, the apparatus comprising:

DOCKET NO. 123857-00002 (SAND06-07196)

SERIAL NO. 10/695,304

PATENT

an input for receiving first information determined from a first flight pass of an antenna pair carried together on an aircraft, and second information determined from a second flight pass of an antenna pair carried together on an aircraft, the first information specifying a first geometric relationship between the first flight pass and a reference point, and the second information specifying a second geometric relationship between the second flight pass and said reference point;

a distance estimator coupled to said input ~~and responsive for applying geometric analysis to~~ said first and second ~~information for estimating geometric relationships to estimate~~ an antenna baseline length between the first and second flight passes; and

a target information estimator coupled to said input and said distance estimator for estimating one of a ground range position and height of the target based on the antenna baseline length estimate and one of the first and second geometric relationships.

18. (Original) the apparatus of Claim 17, wherein said distance estimator includes a ground range estimator for producing a ground range estimate and a height estimator for producing a height estimate.

19. (Original) The apparatus of Claim 17, wherein said target information estimator includes an antenna angle estimator for determining an antenna angle and a sign of the antenna angle.

20. (Currently Amended) The apparatus of Claim 19, wherein the sign of the antenna angle is positive when [[a]] the reference point is located horizontally between a predetermined point spatially associated with the corresponding antenna pair and the target and negative when the target is between the reference point and the predetermined point.

21. (Original) The apparatus of Claim 19, wherein said target information estimator includes both a ground range position estimator for producing the ground range position of the target and a height estimator for producing the height of the target.

DOCKET NO. 123857-00002 (SAND06-07196)**SERIAL NO. 10/695,304****PATENT**

22. (Original) The apparatus of Claim 21, wherein said height estimator is for producing first and second height estimates and said ground range position estimator is for producing first and second ground range estimates, said target information estimator including a selector coupled to said antenna angle estimator, said ground range position estimator, and said height estimator for selecting one of the first and second ground range position estimates and one of the first and second height estimates based on the sign of the antenna angle.